Master Gardener Training Material
SUPPLEMENTAL

DISEASE SYMPTOMS
Quick reference list

(From Martha Mikkelson, Plant Disease Diagnostician, Montana State University)

Root symptoms

Injury to the root system often includes yellowing, stunting, or wilting of above-ground parts.

Wash off the roots when possible and look for the following:
- Small discolored or dead areas (fungi).
- General death of the feeder roots or the entire root system (fungi).
- Discoloration of the vascular tissue in the crown and lower stem (fungi, such as Verticillium spp. and Fusarium spp., bacteria).
- Galls on roots (crown gall (caused by bacterium Agrobacterium tumefaciens, fungal diseases such as club rot of cabbage, root knot nematodes)

Symptoms on storage organs

Storage organs include tubers, bulbs, and corms. Symptoms on these organs include:
- Discolored or dead areas that go deep into storage organs (fungi, bacteria)
- Dry rots (fungi).
- Soft rots accompanied by strong, repulsive odors (bacterial pathogens, such as Erwinia spp.) (Frequently, bacterial soft rots move into tissue originally attacked by pathogenic fungi, making diagnosis of the original pathogen difficult.)
- Scabby lesions on potato skins (bacteria such as common scab).
- Galls on storage organs (fungi, nematodes).
- Internal problems (several viruses or bacteria, such as ring rot of potato).

Seedling diseases

- Seedlings fail to emerge, or fall over and die (damping-off caused by fungi such as Rhizoctonia, Pythium, and Fusarium)
- Dead areas on cotyledons or stems (fungi, bacteria).
Leaf symptoms

- Leaf discoloration or yellowing in localized or distinct patterns (viral).
- Necrotic (dead) areas on leaves, often containing fruiting bodies (fungi)
- Necrotic areas on leaves, often with water-soaked margins (bacterial)
- Small rusty-red, brown or black spots and stripes (fruiting bodies of rusts and smut fungi)
- Leaf distortion (elongated, dwarfed, thickened, etc.) (viral).
- Leaf galls (fungi such as peach leaf curl and oak leaf blister, insects).
- White, powdery substance on leaves (powdery or downy mildew).
- Wilting (vascular wilt fungi, root rot pathogens, bacteria, drought).

Stem, branch, and trunk disorders

- Cankers and complete or partial death of woody stems or branches (fungi and bacteria)
- Sticky ooze from trunks and branches (bacteria, mechanical injury, stress, boring insects, sapsuckers (birds))
- Large conks and bracket-like fruiting structures on trunks and branches (wood-rotting fungi)
- Galls or swellings on lower trunk and/or branches (crown gall bacterium, white pine blister rust)
- Witches' brooms or excessive branching (fungi, mistletoes, phytoplasmas).
- Extreme distortion, enlargement, and flattening of stems or branches (physiological/genetic condition known as fasciation).

Flower symptoms

- Odd color changes (often in a mosaic pattern) and/or distortion (viruses).
- Death of flower parts (fungi such as gray mold (*Botrytis* spp., bacteria)
- Individual flowers or seeds converted into masses of black spores (corn smut).
- Flowers that are green and smaller and more dense than normal (phytoplasma)

Fruit symptoms

- Fruit decays, rots, and superficial spotting or russetting (fungi). Important diagnostic symptoms include specific color of rotted tissue, firmness of the tissue, and signs such as spores or fruiting structures.
- Discolorations and malformations (viruses).
- Discrete spots on fruit or soft rots in storage (bacteria).